We claim:

1. (Amended) A radiating device for [urethral] hyperthermia including a catheter provided at its distal end with an inflatable balloon (7) and adapted to receive multiple injected liquid fluid flows (2,5,8) passing therethrough, a radiofrequency radiating antenna (1) and multiple thermocouples (6,6',6"), the radiating antenna being submerged within [said] a fluid flow, characterized in that

said radiating antenna (1) is submerged within a flow which proceeds through a central channel (2) surrounding said radiating antenna (1) towards the distal end of said catheter and passes from said catheter through a first opening (3) into [the] a bladder to be treated, while flowing back into said catheter towards the proximal end thereof through a second separate opening (4) of a side channel (5) surrounding the power supply cables of said thermocouples (6,6',6"),

the ends of said thermocouples (6,6',6") project out of said second opening (4), being thus deflected outwards into the bladder when said balloon (7) is inflated by injecting a fluid through a second side channel (8) and third opening (9), whereby the outwardly deflected ends of said thermocouples (6,6',6") come into tangential engagement with [the] a bladder wall (32) irradiated by said antenna (1).

2. A radiating device including a catheter provided at its distal end with an inflatable balloon and adapted to receive multiple injected liquid fluid flows passing therethrough, a radiofrequency radiating antenna and multiple thermocouples, the radiating antenna being submerged within a fluid flow, characterized in that

said radiating antenna is submerged within a flow which proceeds through a central channel surrounding said radiating antenna towards the distal end of said catheter and passes from said catheter through a first opening into an organ to be treated, while flowing back into said catheter towards the proximal end thereof through a second separate opening of a side channel surrounding the power supply cables of said thermocouples,

the ends of said thermocouples project out of said second opening, being thus deflected outwards into the organ when said balloon is inflated by injecting a fluid through a second side channel and third opening, whereby the outwardly deflected ends of said thermocouples come into tangential engagement with a wall of the organ irradiated by said antenna.

3. A radiating device including a catheter provided at its distal end with an inflatable balloon and adapted to receive multiple injected liquid fluid flows passing therethrough, a radiofrequency radiating antenna and multiple thermocouples, the radiating antenna being submerged within a fluid flow, characterized in that

said radiating antenna is submerged within a flow which proceeds through a central channel surrounding said radiating antenna towards the distal end of said catheter and passes from said catheter through a first opening into an organ to be treated, while flowing back into said catheter towards the proximal end thereof through a second separate opening of a side channel surrounding the power supply cables of said thermocouples,

the ends of said thermocouples project out of said second opening, being thus deflected outwards into the organ when said balloon is inflated by injecting a fluid through a second side

channel and third opening, whereby the outwardly deflected ends of said thermocouples come into engagement with a wall of the organ irradiated by said antenna.

4. A radiating device for irradiating an organ comprising:

a catheter provided with an inflatable balloon and including a central channel, first and second side channels, and first, second, and third openings;

an antenna, situated at a first end portion of the catheter, the antenna being submerged in a first fluid that flows through the central channel surrounding the antenna towards the first end portion of the catheter, passes from the catheter through the first opening, and flows back into the catheter towards a second end portion thereof through the second opening; and

a plurality of thermocouples, having ends, the plurality of thermocouples extending along the first side channel of the catheter, each of the ends of the plurality of thermocouples projecting out of the second opening and being deflected outwards when the balloon is inflated by injecting a second fluid through the second side channel and the third opening,

wherein the deflected ends of the plurality of thermocouples contact a wall of the organ irradiated by the antenna.

5. A radiating device for irradiating an organ comprising:

a catheter provided with an inflatable balloon and including first and second channels and a first opening;

an antenna, situated at an end portion of the catheter, the antenna being submerged in a fluid that flows through the first channel surrounding the antenna and into the organ; and

a plurality of thermocouples, having ends, the plurality of thermocouples extending along the second channel, each of the ends of the plurality of thermocouples projecting out of the first opening and being deflected outwards when the balloon is inflated,

wherein the deflected ends of the plurality of thermocouples contact a wall of the hollow organ irradiated by the antenna.

6. A radiating device for irradiating an organ comprising:

a catheter provided with an inflatable balloon;

an antenna, situated at an end portion of the catheter, for irradiating the organ;

a channel for providing a fluid to the organ; and

a plurality of thermocouples, having ends, the plurality of thermocouples extending along the catheter, each of the ends of the plurality of thermocouples being deflected outwards when the balloon is inflated,

wherein the deflected ends of the plurality of thermocouples contact a wall of the organ irradiated by the antenna.

7. A radiating device for irradiating an organ comprising:

a catheter provided with an inflatable balloon and including first and second channels and a first opening;

an antenna, situated at an end portion of the catheter, the antenna being submerged in a fluid that flows through the first channel surrounding the antenna and into the organ; and

a plurality of temperature sensing devices, having ends, the plurality of temperature sensing devices extending along the catheter, each of the ends of the plurality of temperature sensing devices being deflected outwards when the balloon is inflated,

wherein the deflected ends of the plurality of temperature sensing devices contact a wall of the organ irradiated by the antenna.

8. A radiating device for irradiating an organ comprising:

a catheter provided with an inflatable balloon;

an antenna, situated at an end portion of the catheter, for irradiating the organ;

a channel for providing a fluid to the organ; and

a plurality of temperature sensing devices, having ends, the plurality of temperature sensing devices extending along the catheter, each of the ends of the plurality of temperature sensing devices being deflected outwards when the balloon is inflated,

wherein the deflected ends of the plurality of temperature sensing devices contact a wall of the organ irradiated by the antenna.

9. A radiating device for irradiating an organ comprising:

a catheter;

an antenna, situated at an end portion of the catheter, for irradiating the organ;

a channel, within the catheter, for providing a fluid comprising a cytotoxic substance to the organ; and

a plurality of temperature sensing devices, having ends, the plurality of temperature sensing devices extending along the catheter, each of the ends of the plurality of temperature sensing devices being deflected outwards after the catheter is inserted into the organ,

wherein the deflected ends of the plurality of temperature sensing devices contact a wall of the organ irradiated by the antenna.

10. A radiating device for irradiating an organ comprising:

a catheter, including a channel for providing a fluid to the organ;

an antenna, situated at an end portion of the catheter, for irradiating the organ; and

a plurality of temperature sensing devices, having ends, the plurality of temperature sensing devices extending along the catheter, each of the ends of the plurality of temperature sensing devices being deflected outwards after the catheter is inserted into the organ,

wherein the deflected ends of the plurality of temperature sensing devices contact a wall of the organ irradiated by the antenna.

11. A radiating device for irradiating a cavity comprising:

a catheter;

an antenna, situated at an end portion of the catheter, for irradiating the cavity;

a channel for providing fluid to the cavity; and

a plurality of temperature sensing devices, having ends, the plurality of temperature sensing devices extending along the catheter, each of the ends of the plurality of temperature sensing devices being deflected outwards after the catheter is inserted into the cavity,

wherein the deflected ends of the plurality of temperature sensing devices contact a wall of the cavity irradiated by the antenna.

12. The radiating device as recited in claim 11, wherein the channel is within the catheter.

13. The radiating device as recited in claim 12, wherein the antenna is within the channel.

14. The radiating device as recited in claim 13, wherein the fluid flows by the antenna and into the cavity.

15. The radiating device as recited in claim 11, further comprising a shielded cable coupled to the antenna.

16. The radiating device as recited in claim 15, wherein the fluid flows by the shielded cable and the antenna and into the cavity.

17. The radiating device as recited in claim 11, further comprising means for providing a second fluid around the antenna.

18. The radiating device as recited in claim 11, wherein the fluid comprises a conditioning liquid.

19. The radiating device as recited in claim 11, wherein the fluid comprises a solution of a selective cytotoxicity substance.

20. The radiating device as recited in claim 11, wherein a frequency range of the antenna is 900-1000 MHz.

21. The radiating device according to claim 11, wherein the antenna comprises a linear dipole antenna.

22. The radiating device according to claim 21, wherein the linear dipole antenna comprises a coil-shaped segment and a linear conductor.

23. The radiating device according to claim 22, further comprising:

a first plastic sleeve surrounding a portion of the linear conductor;

a metal braiding surrounding the first plastic sleeve;

a second plastic sleeve surrounding the metal braiding;

a metal cylinder surrounding the second plastic sleeve and electrically coupled to the metal braiding; and

a third plastic sleeve surrounding the metal cylinder.

24. The radiating device as recited in claim 11, further comprising a stainless steel wire coupled to each of the plurality of temperature sensing devices.

25. The radiating device as recited in claim 11, further comprising means for retaining the plurality of temperature sensing devices prior to deflection.

26. The radiating device according to claim 25, wherein the retaining means comprises at least one notch.

27. The radiating device according to claim 11, further comprising a sealing member for sealing the antenna.

28. The radiating device according to claim 27, further comprising a sealing member for each of the plurality of temperature sensing devices.

29. The radiating device according to claim 27, wherein the sealing member comprises a polytetrafluoroethylene layer.

30. The radiating device according to claim 11, further comprising a second plurality of temperature sensing devices for detecting temperatures at predetermined positions along the antenna.

31. The radiating device according to claim 30, wherein each of the second plurality of temperature sensing devices is coupled to a power supply cable.

32. The radiating device according to claim 31, wherein each of the power supply cables is wound into a helical coil.

33. The radiating device according to claim 11, wherein the deflected ends of the plurality of temperature sensing devices tangentially contact the wall of the cavity.

34. The radiating device according to claim 11, wherein the catheter further comprises an inflatable balloon.

35. The radiating device according to claim 34, wherein the balloon is inflated by a second fluid.

36. The radiating device according to claim 35, wherein the second fluid is a liquid.

37. The radiating device according to claim 35, wherein the second fluid is a gas.

38. The radiating device according to claim 34, wherein the catheter comprises a second channel in communication with the balloon for providing a second fluid to inflate the balloon.

39. The radiating device according to claim 34, wherein each of the ends of the plurality of temperature sensing devices is deflected outwards when the balloon is inflated.

40. The radiating device according to claim 11, wherein the catheter comprises a first opening for providing the fluid into the cavity and a second opening allowing for circulation out of the cavity.

41. The radiating device according to claim 34, wherein the catheter comprises a first opening for providing the fluid into the cavity and a second opening allowing for circulation out of the cavity.

42. The radiating device according to claim 41, wherein the catheter comprises a third opening for providing a second fluid to inflate the balloon.

43. The radiating device according to claim 11, wherein the cavity is an organ.

44. The radiating device according to claim 11, wherein the cavity is a hollow organ.

45. The radiating device according to claim 11, wherein the cavity is a bladder.

46. The radiating device according to claim 11, further comprising means for protecting the cavity wall from excess heat from the antenna.

47. The radiating device according to claim 11, further comprising means for preventing the catheter from being displaced from the cavity.

48. A method of performing hyperthermal therapy comprising the steps of:

inserting a catheter, including an inflatable balloon, an antenna, and a plurality of thermocouples, into an organ;

providing a supply of a first fluid such that the first fluid flows through a first channel of the catheter and circulates out a first opening in the catheter through the organ and into a second opening in the catheter and through a second channel of the catheter; and

inflating the balloon by passing a second fluid through a third channel of the catheter and out a third hole in the catheter and into the balloon, such that the plurality of thermocouples are deflected by the inflated balloon and contact a wall of the organ.

49. A method of performing hyperthermal therapy comprising the steps of:

inserting a catheter, including an inflatable balloon, an antenna, and a plurality of temperature sensing devices, into an organ;

providing a supply of a first fluid such that the first fluid flows through a first channel of the catheter and circulates out a first opening in the catheter through the organ and into a second opening in the catheter and through a second channel of the catheter; and

inflating the balloon by passing a second fluid through a third channel of the catheter and out a third hole in the catheter and into the balloon, such that the plurality of temperature sensing devices, carried in the second channel, are deflected by the inflated balloon and contact a wall of the organ.

50. A method of performing hyperthermal therapy comprising the steps of:

inserting a catheter, including an inflatable balloon, an antenna, and a plurality thermocouples, into an organ;

irradiating the organ by generating radiation using the antenna;

providing a supply of a fluid through the catheter and into the organ; and

inflating the balloon such that the plurality of thermocouples are deflected by the inflated balloon and contact a wall of the organ.

51. A method of performing hyperthermal therapy comprising the steps of:

inserting a catheter, including an inflatable balloon, an antenna, and a plurality of temperature sensing devices, into an organ;

irradiating the organ by generating radiation using the antenna;

providing a supply of a fluid through the catheter and into the organ; and

inflating the balloon such that the plurality of temperature sensing devices are deflected by the inflated balloon and contact a wall of the organ.

52. A method of performing hyperthermal therapy comprising the steps of:

inserting a catheter, including an antenna and a plurality of temperature sensing devices, into an organ;

irradiating the organ by generating radiation using the antenna;

providing a supply of a fluid comprising a cytotoxic substance through the catheter and into the organ; and

deflecting the plurality of temperature sensing devices to contact a wall of the organ.

53. A method of performing hyperthermal therapy comprising the steps of:

inserting a catheter, including an antenna and a plurality of temperature sensing devices, into an organ;

irradiating the organ by generating radiation using the antenna;

providing a supply of a fluid through the catheter and into the organ; and

deflecting the plurality of temperature sensing devices to contact a wall of the organ.

54. A method of performing hyperthermal therapy comprising the steps of:

inserting a catheter, including an antenna and a plurality of temperature sensing devices, into a cavity;

irradiating the cavity by generating radiation using the antenna;

providing a supply of a fluid into the cavity; and

deflecting the plurality of temperature sensing devices to contact a wall of the cavity.

55. The method of performing hyperthermal therapy according to claim 54, wherein the providing step comprises the step of providing the fluid through the catheter and into the cavity.

56. The method of performing hyperthermal therapy according to claim 55, wherein the step of providing comprises the step of flowing the fluid past the antenna.

57. The method of performing hyperthermal therapy according to claim 54, wherein the fluid comprises a conditioning liquid.

58. The method of performing hyperthermal therapy according to claim 54, wherein the fluid comprises a solution of a selective cytotoxicity substance.

59. The method of performing hyperthermal therapy according to claim 54, wherein the catheter includes a balloon.

60. The method of performing hyperthermal therapy according to claim 59, further comprising the step of:

inflating the balloon such that the plurality of temperature sensing devices are deflected by the inflated balloon and contact the wall of the cavity.

61. The method of performing hyperthermal therapy according to claim 60, wherein the inflating step comprises the step of inflating the balloon with a liquid.

62. The method of performing hyperthermal therapy according to claim 60, wherein the inflating step comprises the step of inflating the balloon with a gas.

63. The method of performing hyperthermal therapy according to claim 54, further comprising the step of controlling a volume of the fluid in the cavity.

64. The method of performing hyperthermal therapy according to claim 54, further comprising the step of evacuating gas introduced by the providing step to prevent irradiation non-uniformities.

65. The method of performing hyperthermal therapy according to claim 54, further comprising the step of controlling a temperature of the fluid.

66. The method of performing hyperthermal therapy according to claim 54, further comprising the step of controlling a flowrate of the fluid.

67. The method of performing hyperthermal therapy according to claim 54, further comprising the step of sensing temperatures at different locations by modifying a location of the temperature sensing devices.

68. The method of performing hyperthermal therapy according to claim 54, further comprising the step of generating therapeutically active radiation using the antenna to achieve a temperature within the cavity lethal for cancer cells.

69. The method of performing hyperthermal therapy according to claim 54, further comprising sensing a temperature at various positions along the antenna with a second plurality of temperature sensing devices.

70. The method of performing hyperthermal therapy according to claim 54, further comprising sensing a temperature at various positions along the antenna and a shielded cable coupled to the antenna with a second plurality of temperature sensing devices.

71. The method of performing hyperthermal therapy according to claim 54, wherein the plurality of temperature sensing devices come into tangential contact with the wall of the cavity.

72. The method of performing hyperthermal therapy according to claim 54, wherein a second plurality of temperature sensing devices come into tangential contact with the wall of the cavity.

73. The method of performing hyperthermal therapy according to claim 54, further comprising the step of controlling a temperature of the wall of the cavity.

74. The method of performing hyperthermal therapy according to claim 54, further comprising the step of controlling a temperature of the antenna.

75. The method of performing hyperthermal therapy according to claim 54, wherein the inserting step comprises inserting the catheter into an organ.

76. The method of performing hyperthermal therapy according to claim 54, wherein the inserting step comprises inserting the catheter into a hollow organ.

77. The method of performing hyperthermal therapy according to claim 54, wherein the inserting step comprises inserting the catheter into a bladder.

78. The method of performing hyperthermal therapy according to claim 54, further comprising the step of protecting the cavity wall from excess heat from the antenna.

79. The method of hyperthermal therapy according to claim 54, further comprising the step of preventing the catheter from being displaced from the cavity.